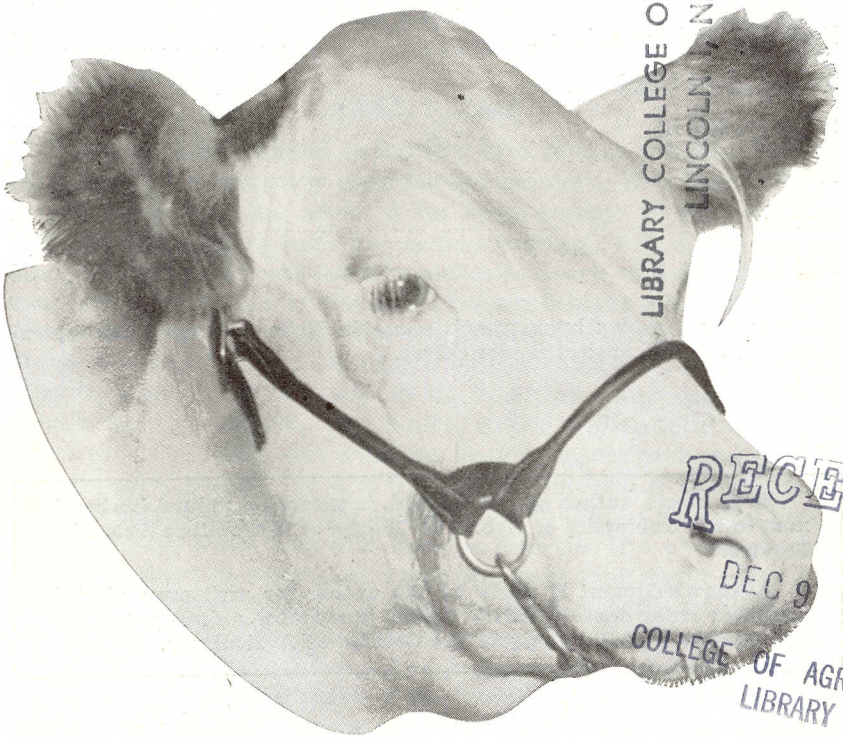
1952

4-H Beef Club Manual : Extension Circular 2-61-2

K. C. Fouts

Extension Circular 2-61-2
October 1952

4-H BEEF CLUB MANUAL



Extension Service
University of Nebraska College of Agriculture
and U. S. Department of Agriculture
Cooperating

CONTENTS

Rear cover shows home ranch scene in Nebraska sandhills, typical source of top 4-H project feeder calves.

K. C. Fouts, author of this manual, is extension animal husbandman in the University of Nebraska College of Agriculture Extension Service.

Acknowledgment is made by the author for assistance of staff members of the departments of animal husbandry, animal pathology, agronomy and entomology of the College of Agriculture.

Distributed in furtherance of Acts of May 8 and June 30, 1914, Extension Service of the University of Nebraska College of Agriculture, United States Department of Agriculture cooperating. W. V. Lambert, Director, Lincoln, Nebraska. (1-48-10M) (4-49-20M, Revised) (10–52–10M)

4-H Beef Club Manual

K. C. Fouts

ANIMAL HUSBANDRY is good management in livestock production. The 4-H club beef projects provide an opportunity to learn through experience, several phases of beef production. At the same time, the activities of the club provide competition and good times when club members are brought together at meetings, camps, fairs and on trips.

Since the beef calf grows as well as fattens, it takes longer to get him ready for market than it does to finish older animals with their framework well grown when they go into the feed lot. Baby beef is the term used to designate finished animals about 12 months but not more than 18 months of age, and weighing from about 700 to 1,100 pounds. They should grade "choice" or "prime" at the market.

MAKE PLANS

THE BEEF CALF project is worthy of a layout suitable for the club member to properly care for the animals. It is best to have quarters ready at the start. A lot large enough to permit exercise, yet not large enough for useless running, will do. It should drain well so that there are dry places as much of the time as the weather permits and at the same time not leave mud holes that are slow in drying. Shade for warm days is desirable as well as protection from strong winds in cold weather. Calves should always have an opportunity to lie down in a dry place and to remain dry themselves. By choice, calves will usually lie down in the open, but cold, wet weather, heat, or insect pests may cause them to seek shelter. It is to the feeder's interest to provide that shelter. A shed open to the south but with a tight roof and walls that will stop wind, rain and snow is desired. If a closed shed is used in winter, be careful to avoid openings that might leave the animals in strong drafts. Within the shed or without, but convenient to the feeder, should be a manger or bunk for hay.

The calves should have a low bunk at first, and not over 26 inches high for the last third of the feeding period. The feed bunk or box should be placed at low height also. By all means, plan to keep chickens away from the feed bunk. Calves will not take on a full feed of grain having the odor or taste of chicken droppings. Sparrows may become a pest too. The salt and mineral box should be in the shed. The shed that can be closed off has advantages in case of severe snow storms, and poultry control, and lends

itself to easy darkening or screening in summer to keep flies out. Some club members go to extra work in providing means of insulation against the summer heat. A shed with a loft helps out in this respect. Some club members use power-driven fans on extremely hot days to provide circulation of air in the calf shed.

Some club members manage to locate their calf lot so that it reaches the farm stock tank. This is a labor-saving arrangement. At any rate, a supply of clean, fresh water should be available all the time. Half of a barrel makes a good water container for two calves. Wood is preferable to the metal of a steel drum as the water remains cool longer in summer and does not freeze as quickly in winter. The feed supply should be conveniently located. Steel drums with the heads cut out make satisfactory small bins for feed. They can be easily covered and they preserve the feed against loss by pests. One hundred pounds of feed can be mixed in a drum at a time with a long-handled dirt shovel. Leaning the barrel makes the work easier.

Plan to have one or two panels, made like a section from a fence, four feet high. Use these in making a small catch pen in a corner of the lot or to close off the shed when it is desired to catch the calf in the early stages of training.

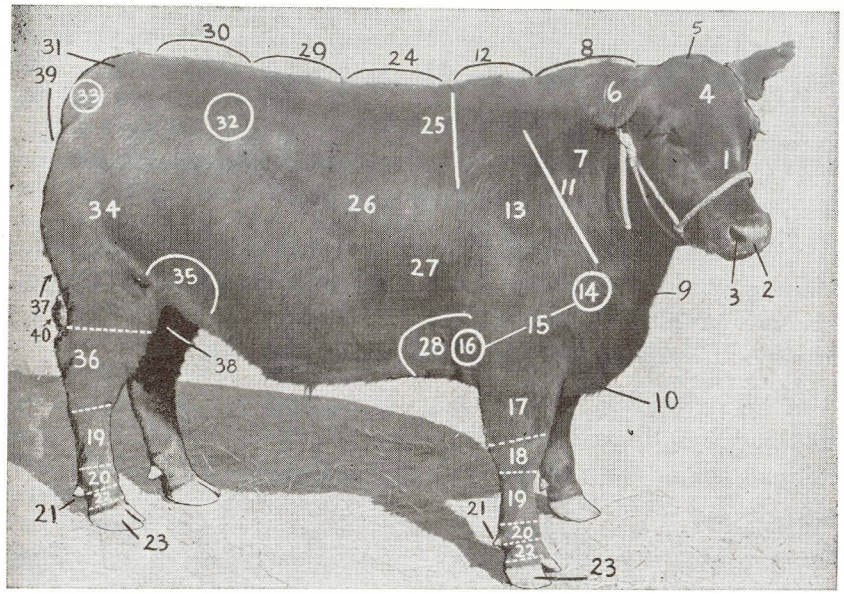
Plans should provide for the probable number of calves in the project. Experience has shown that it is better not to try to feed one calf alone. The labor of caring for two or more is much less, proportionately, than when one is fed. On the other hand, when the training and work of fitting for show is taken into account, a club member is likely to attempt fitting too many calves. Two or more members of a family enrolled together for the project may feed their calves together. If but one desirable calf is available, a low-priced calf may be fed with it to provide companionship.

While feeding beef cattle is generally regarded as a means of marketing products of the farm, the feeder should not expect the farm to always yield the crops needed to provide feed. Rather, the feeding program is adjusted to the feeds available. Over any period of years, club members have found that unusual conditions develop in the situation between the start and finish of a feeding project lasting for 10 months. They have learned that it pays to provide the feed supply well in advance of needs so that sudden changes or shortages in the ration can be avoided. It does not pay to permit the feed supply to run out.

Here are some items for the feed budget based on the approximate needs of one beef calf on feed 10 months. Minerals listed exceed needs but some loss may be expected.

Corn (or other grain equivalent)	55 bushels
Protein supplement (linseed oil meal, cottonseed oil meal, soybean oil meal)	400 pounds
Hay, prairie	½ ton
green alfalfa	½ ton
Salt	30 pounds
Ground limestone	25 pounds
Steamed bone meal	25 pounds

It pays to have what is needed on hand.



PARTS OF THE STEER

1. Face
2. Muzzle
3. Nostril
4. Forehead
5. Poll
6. Ear
7. Neck
8. Crest
9. Dewlap
10. Brisket
11. Shoulder vein
12. Top of shoulder
13. Shoulder
14. Point of shoulder
15. Arm
16. Elbow
17. Forearm
18. Knee
19. Shank
20. Fetlock
21. Dewclaw
22. Pastern
23. Foot
24. Back
25. Crops
26. Ribs
27. Forerib
28. Foreflank
29. Loin
30. Rump
31. Tailhead or tail setting
32. Hip or hook
33. Pinbones
34. Thigh
35. Hind flank
36. Hock
37. Twist
38. Cod
39. Tail
40. Switch

Following are some of the common descriptive terms. Others are defined throughout this circular.

Blocky. Body conformation when compact, or deep, short, thick and low-set.

Carcass. The body of a meat animal as it is prepared for use as meat, but before it is cut up.

Condition. Stage of finish with reference to amount of fat.

Fill. Usually refers to the extended middle due to feed and water content.

Finish. Satisfactory degree of fatness.

Gobby. Excessively uneven covering of fat.

Hoof. The horny covering of the foot.

Leggy. Legs too long, found in animals called "up standing."

Muley. Same as polled. Naturally hornless.

Natural fleshing. Presence of muscle as distinguished from fat.

Open shoulders. Shoulder blades not smoothly laid in, usually with a depression on top.

Patchy. Uneven finish, less severe than gobbiness.

Paunchy. Too much middle.

Rangy. Too long and tall.

Rugged. Strong and sturdy but not necessarily coarse.

Scale. Size.

Scurs. Small, irregular growths of horny, but loose, tissue where horns grow.

Shank. In the live meat animal it is that part of the leg directly below the knee or hock. In the carcass it is that part of the leg directly above these joints.

Style. Pleasing appearance due to attractive conformation, animation and grace of movement.

Tie. A depression on the back where the skin is attached to the parts of the backbone that project upward. It becomes deeper as the covering thickens.

Typy. Having a pleasing general conformation.

Wasty. Excess fill or finish that detracts from the possible yield on slaughter.

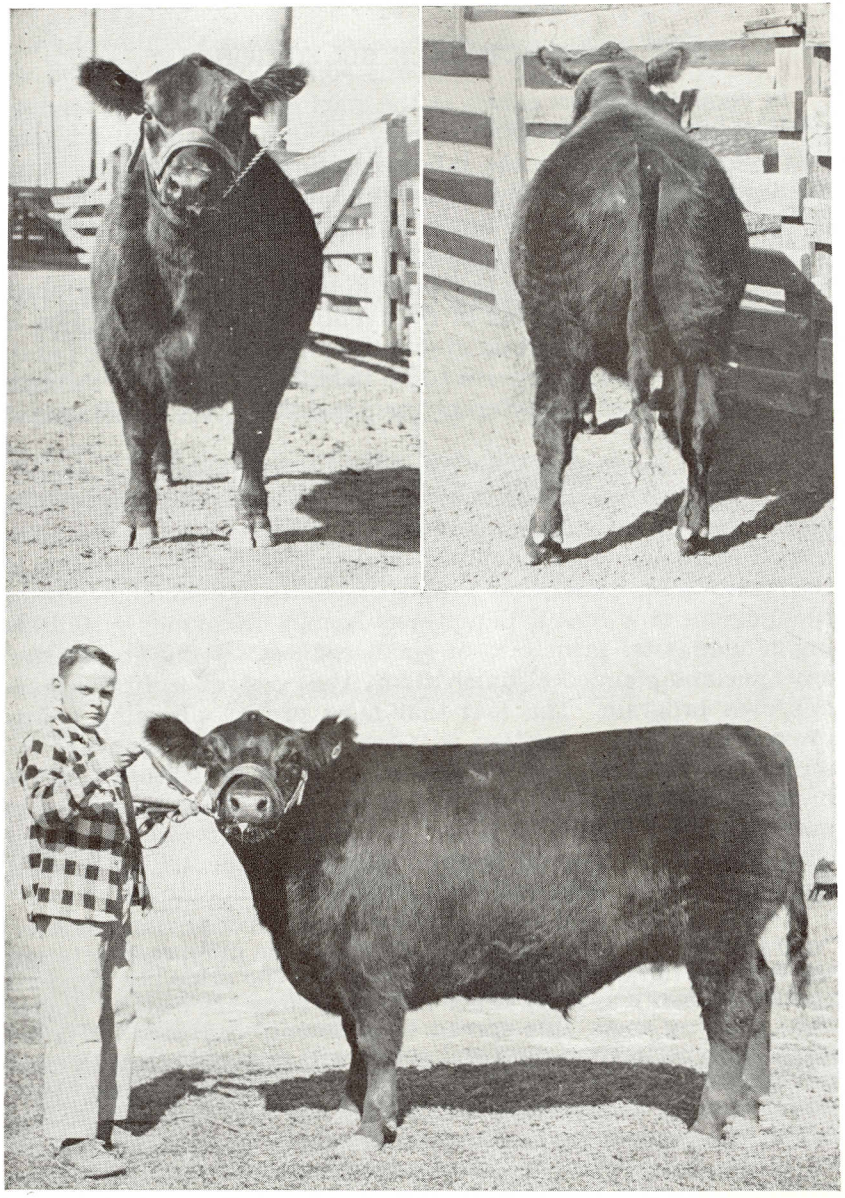
PROJECT CALF SELECTION

IN CHOOSING FEEDER calves at the start of the 4-H beef feeding project, animals are sought that may develop into the kind placed at the top by judges at the fall shows. Selections are made with the ideal for the finished animal in mind. It has been fairly well proven that, regardless of breed, this so-called beef type is associated with animals superior in beef production. In general, they are compact or short, deep and thick in body, set low to the ground and carry a thick covering of fat evenly laid on. The topline is straight, with the underline giving the impression of being parallel to it, while there appears to be balance to the body through good proportion of the different parts and their neat blending, one into the other.

The beef feeding project provides a very interesting experience for parents and leaders as well as the club member. Public acclaim given participants at junior shows may cause some misplaced emphasis. The conclusion of most former club members is that the over-all experience in the project far exceeds the value of the incident of winning. The project should be carried by following fundamental principles of good business. It may be started any time and planned to finish at any time desired to fit the feeder's own program. The fact that most project planning points toward time of competition is, after all, incidental and not required. In the past, less than one-third of all beef project calves have reached the show ring and most of the latter sold close to market prices. Plainly, it is best to count on carrying the project on a sound basis, keeping in mind that, to be successful, one must "buy right, feed right, sell right."

In buying it is well to know usual market trends. Particularly, "margin" should be understood. Margin is the difference between the cost per hundred of the feeder calf and the price per hundred received when it is sold. Since fattening costs are usually higher than growing costs, this spread is commonly expected. Detailed study of experimental data and prices will give variations in margin applicable in feeding cattle of different ages, grade, condition, under varying lengths of feeding period and feed costs. In feeding cattle as a project by youth, it may well be considered that for centuries, competition and praise for deeds well done have been accepted as good methods to employ in education. Hence, the justification in this circular for the attention given in assisting club members to meet competition as they become acquainted with the details incidental to the solution of their problems.

Since most club members do not have access to desirable feeder calves at home, it is necessary that they seek calves else-



This calf was deep, thick and low-set. He was the top calf at the Republican Valley 4-H Livestock Show at McCook in 1947, and was shown by Jerry Slagle, Perkins county. Note the smooth, thick covering in lower picture. At upper left, note the short shank, straight foreleg, brisket carried up smoothly, and smoothly laid in shoulder. Picture at upper right shows well-filled rump, thick thigh, and a straight hind leg.

where. This makes it necessary to select calves that are old enough to wean. While most show rules permit club calves to have milk until the calves are 10 months of age, it is not the general practice and most calves are weaned at six to seven months. Occasionally a young calf is placed on a nurse cow to advantage in getting it to a suitable weaning age. Most of the state and interstate shows have several classes for each breed, determined according to weight or age. This permits quite a range for selection as to size of calf at the start. The range in weight, from a light weight class at an early show to the heavy class of the late shows, permits finishing so that a calf may fit some class when he is in his best show form. Experience teaches that fitting a calf to have him at his best at a given time and weight is an accomplishment worthy of a great deal of respect.

Calves from mature cows are usually stronger and weigh more at the same weaning age than those from first-calf heifers. They also usually make higher average daily gains. Desirable conformation, good quality and the ability to make high average daily gains usually come from several generations of sires and dams of good beef type and quality of the same breed. Carcasses yielding a high percentage of meat may be expected for the same reason. While occasionally a cross-bred (a calf with a good sire from one breed and the dam from another), makes a good show record, most of them do well on gains but fail to retain the balance and symmetry of conformation found in calves whose ancestry is of one breed. The calves of some one strain or family within a breed have likewise proven to be superior to the majority of the calves of the same breed. Calves of these known families are much sought-after by club members. Conformation may indicate a great deal, but additional information on proven ancestry lends encouragement.

Calves that have been allowed to run as bulls until weaning time should be selected with caution. If the head is coarse, the neck and shoulders heavy, the bone of the shank too thick, the hide heavy and the conformation of the rump lacking in the neatness usually found in the steer, it is doubtful if the calf will prove as desirable as a calf that was castrated at two or three months of age. Generally, good steer calves from 325 to 450 pounds should be selected. By adding about 50 pounds per month from weaning time to show time, the final weight can be estimated fairly closely. Allowances should be made for a calf carrying a lot of bloom or baby fat. A thin calf of heavy weight is likely to be too old, particularly if his tail shows more length than that noticeable on most calves.

A good-type 4-H calf. He has balance. This calf became a class winner.

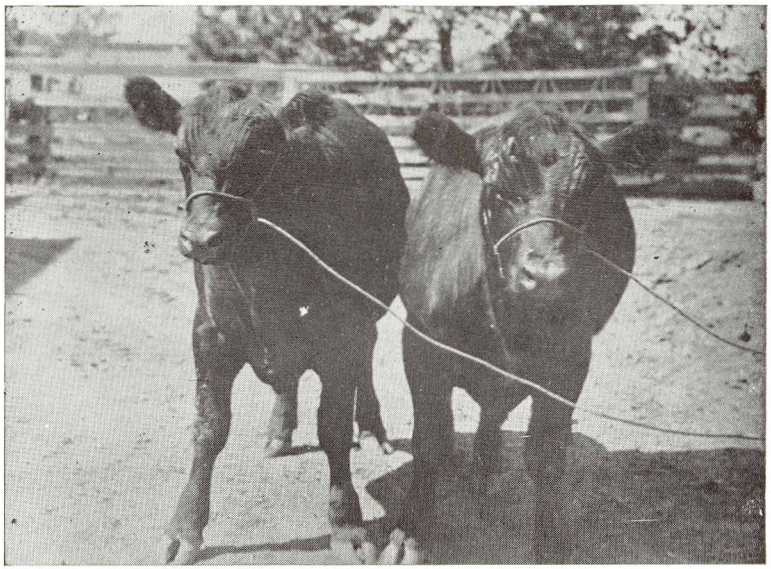
Instinctively, the head of the calf is noted. A short, wide face with broad muzzle, open nostril and depth through the jaw is looked for. A wide open eye, quiet but alert, and a general impression of being clean cut or trim about the head attracts one. Avoid undue heaviness about the eyes, excess loose skin under the jaw and particularly avoid long narrow heads with muzzles that have the appearance of being "pinched." An alert carriage of the head, free from wildness, indicates style and contributes to much desired flash. Do not select the wild, unresponsive calf with the restless movements. He is usually the fellow with the small-appearing eyes that have a glassy look, and he moves too quickly. He carries his head a little too high and with his face in a too near perpendicular position. Avoid this kind. They are usually too restless to gain well and they certainly do not respond well to training. The possibility of injury to the club member in handling this kind is too great to justify trying.

Since the weanling calf does not carry the fat of the finished baby beef, those points are sought that indicate possible desired characters of the fat calf. The feeder calf should be compact, deep and thick in body and set low to the ground. Long hair is usually carried by weanling calves in the fall and a thrifty calf usually has a full middle. These should be noted carefully for they make a calf seem more low-set than he actually is. One fairly safe indication of low-setness may be noted in the length of the shank, the bone below the knee and above the fetlock of the front leg. The shank bone will vary little in thin or fat animals. Select calves with a short shank. Thickness can be noted usually by associating it with good spring of rib. Sides that round out well from the backbone show good spring of rib. Ribs that do not round out but slope rather straight are called "slab sided," and are usually associated with bodies lacking in thickness. They may add to the appearance of depth, but when depth is associated with narrowness it is of little advantage.

The brisket, the fleshiness covered with loose skin on the breastbone between the forelegs and extending forward, should be noted carefully. Prominent, low briskets are misleading if they give the impression of low-setness. Further, the low brisket usually is an obstacle to balance, and without balance calves do not excel in general appearance. Look for the brisket carried up smoothly. It is usually found associated with a well-rounded rib. This conformation makes balance with the depth of the rear quarters easier to find. Deep thighs in thin cattle are indicated by the angle at the bottom being let well down to the hock and the contact between the thighs, as formed by the twist, being low. Low, full rear flanks usually are found with the thigh or round that carries down well.

Note the well filled twist.

After finding a deep, thick, low-set calf with balance, attention should go to points of more detail. Good lines and smoothness are also closely associated with balance. A straight, level topline is always desirable. The shoulders should have the appearance of being laid in evenly with the lines of the body and not have the appearance of having been built on to the sides. There appears to be a direct relationship between straightness of legs and shoulders smoothly laid in. Forelegs that are close together at the knees with the feet further apart are associated with a rather prominent point of shoulder and "open" shoulders as noted by a depression between the shoulders at the top. Definitely, the point of the shoulder should be smoothly laid in so that it may more easily be covered with flesh.



A medium and an excellent feeder. The calf at right has a more desirable head as it is shorter, wider and stronger. He is lower-set.

Since the loin is the highest priced cut in the carcass, it should be wide and thick. But it should also blend smoothly with the topline. Loins that have bulging muscles usually are also narrow. At least calves having this character usually fail to finish out with the desired symmetry found when parts blend smoothly, one into the other. A flat shallow loin is to be avoided also. Next to the loin, at either side, are the hipbones. Sometimes they are called "hooks." It is a compliment to constructive breeding that animals are increasingly common with the hips so smoothly laid in and well covered with flesh that their exact location is scarcely noticeable to the eye. These smooth hips are not merely attainments of the fancier. They receive less bruising in shipping and in going through gates. A bruised hip, with but a small area of discolored meat on the carcass, frequently causes the whole hindquarter to sell at a sharp discount and may prevent its acceptance for shipping to a higher market.

The thigh and rump should be long from front to rear as indicated by the distance from the hipbone to the rear end, or to the pinbones. With the pinbones wide apart, but smooth and well covered, width is given to the rear end. When the pinbones are close together, the rear end appears narrow or "peaked." The

pinbones should be slightly lower than the hipbones. When they are high or on a level with the hipbones, the conformation is usually associated with a high tail setting which is difficult to cover smoothly in finishing. High pinbones also are usually associated with a flat, low loin. Pinbones placed too low give the conformation referred to as "droopy" which is also to be avoided.

Another accomplishment of the breeder is the fullness of the muscles between the hip and the pinbone and extending over the rump. This well-rounded conformation certainly adds to the symmetry of the parts. It is still rather common to see this region flattened or depressed and unyielding to the touch. Playing a deflnite part in the conformation of the rump is the tailhead. The term "tail setting" probably is more suitable in designating the attachment of the tail to the body. The tail should be free from coarseness and be placed so that it has the effect of completing the appearance of balance. It should reach the extreme rear before extending down. Faulty tail settings include those too far forward and those too high to enable smoothly covering with fat. Some rumps have serious depressions just ahead of the tail setting. They present a situation difficult to correct.

The legs should be placed neatly under each quarter and be straight. The calf that can stand for 20 minutes without flinching usually has good legs well placed. Shoulder conformation is somewhat associated with the conformation of the foreleg. Some relationship can be noted between the rump and the conformation of the hind leg. A sloping rump with pinbones close together usually is associated with crooked hind legs that stand too close at the hocks. Many good calves would be still better calves if they had straight hind legs.

The size and quality of the bone as indicated in the shanks and joints should be noted. Avoid noticeably large joints. They are usually associated with heads that are large in proportion to the size of the animal. Regardless of the attractiveness of the over-all type, these calves are generally too small for their age and usually make average daily gains inconsistent with the purpose for which the beef animal is bred. When the joints and shanks appear to be in proportion but still are too heavy for their purpose, the calves are described as "coarse." They do not usually have the fineness of hair nor the clean-cut conformation that is taken to denote good quality.

The skin of the beef animal should have reasonable thickness, but it should be loose and pliable. Thin-skinned animals are not considered the best doers. Beef animals spend much of their lives

roughing it in the open and their good covering contributes to their ability to withstand rugged conditions. A good coat of hair is desired as it is associated with the ability to do well, because it is for protection. It certainly helps in achieving the best possible appearance in the fitted animal. Thickness and fineness of the coat are desired, as well as length of hair. A coat that appears "furry" is preferable to one that may be described as "hairy." Correct color markings for the breed are desirable, but the judge will not discriminate against variations from approved coloring in classes for market animals at the shows.

Weanling calves vary a great deal in their condition according to the age or the ability of their dams otherwise to nurse them. The easy access to grass and water during the pasture season has much to do with the condition of calves. But wahtever the condition, evenness of fleshing is wanted. Feeling with the flat hand or fingers over the ribs, shoulders and loin of several calves will make one aware of differences in covering. Differences other than that due to fat can be noted. Differences in hair and skin are usually apparent. What one notes in this sort of handling is the response one receives to the "touch." The appearance of a calf pleasing to the eye due to its attractive coat, carriage or style, excellence of parts and general symmetry is called "flash."

HANDLING THE FEEDER CALF

FEW CLUB MEMBERS have the opportunity to get their calves at the time they are separated from their dams. It is at this time that the training of the calf really starts whether his handlers are aware of it or not. He can no longer depend on his mother. From then on until he is settled in his new surroundings, everything is a new experience to him. What happens in this period has a great deal to do with his future response in the club member's project. There are two things that, if fully appreciated, will provoke thoughtful procedure in every step of the training of the calf. Their observance marks the work of the good herdsman. First, the calf should not be frightened, and second, he should never be made angry. Satisfactory recovery from either experience is never accomplished with some calves, and the job of training is made much more difficult once either mistake has been made. Taking things easy and looking situations over carefully before action is determined usually will prevent either.

Avoid doing things, no matter how trivial, that appear to excite the calf. Talk in natural or quiet tones but avoid the indication of suspense. When people are around, keep them grouped closely, and on one side of the calf. Observing this idea is particularly to

the advantage of visitors, whether trying to see cattle in a pasture or in a truck. In transporting the feeder calf, load one or more quiet animals with him. Do not separate him from quiet company until he acts and feels at home. It is better to plan to feed more than one calf so that companionship is provided.

When the calf reaches his new home he should be given a chance to experience quiet and rest for several days. The incubation period for any possible illness he may have contracted during his exposure through being brought in and taken from his dam, shipped and held in yards, may take 10 days or more. In the meantime he learns to know his new home. He may be homesick and bawl for his dam until in a day or so his voice is good only for a squeak.

Make sure all fences, gates and doors are secure. If a calf just weaned is allowed to get loose, he may travel for miles in search of his dam and be lost or become very much lowered in vitality (run down) before he is returned.

He may be slow in accepting feed, but if the first feed can be like that he knew at home he usually shows interest. In most cases this will be prairie hay. So the alert club member will manage to have some bright, clean and fresh-smelling prairie hay on hand. It's natural feed for the calf. It's like home to him. He should have it. Then he finds the water supply. The water should be clean and fresh. Bad odors or filth should not be tolerated. Next he wants a clean dry place to lie down, out of the wind or drafts but with a soft bed under him. If it can be in the sunlight, so much the better.

STARTING ON THE GRAIN RATION

EATING GRAIN is a new experience to most weanling calves. First they must learn what it is. After the calves have filled well on grass hay and are taking water regularly, it is time to start some concentrate, or feed of high food value but low in fiber. Up to this time it is likely that the droppings have been too hard and dry. From this time on the careful feeder will always note the droppings as an indication of the way calves are responding to their feed. Droppings should be soft enough to settle somewhat but not run or flow. Droppings from an animal being fed a proper ration are not particularly offensive in odor. An improper ration or an animal "off feed" due to some digestive disturbance or disease not related to the ration may account for the decidedly offensive odor noticeable the minute one steps near some feed lots. It has become proverbial that "the eye of the master fattens

the cattle." No other statement so well characterizes the feeder who has in his animals the interest necessary to note their every reaction to feed and care.

A pretty good way to make it easier for calves to start on grain is to put all parts of the ration in the bunk, starting by putting the lighter or bulkier part in first. Calves, being familiar with prairie hay, take to it readily. So put a layer of loose hay six or eight inches thick in the bunk. Wheat bran is fine to use for a few feeds at least. Put a few handfuls per calf on top of the hay. Now put one or two pounds of oats per head on top of the bran. It is interesting to watch the calves start by pulling the hay out first. It is probable that by next feeding time most of the oats will be in the bottom of the bunk. For this feed, mix the hay and the feed quite well. If the calves take to it slowly, turn in a native calf after the isolation period. The club calves will find out what the native is doing and will soon clean up the bunk at each feed. Continue with the bran for a few more feeds, and begin to increase the oats by about one-fourth pound per day per calf. As soon as the calves have learned to eat the grain, there is no further object in feeding it on hay and all the prairie hay the calves clean up should be fed in the hay bunk.

If, after a few days, no illness develops due to infection during weaning and shipping, the grain feeding program may be started. The calves are already taking oats and now they are ready for the addition of a little corn. Their teeth are good and they'll handle shelled corn all right but coarsely ground corn with cob makes a very safe feed, the cob reducing the likelihood of the calves going "off feed." This will taste better if worm-eaten, moldy tips of the ear corn are removed before grinding. When additional calves are secured after the project is under way and the beginning calves are well on feed, the added calves should be kept away from the calves on feed, or fed separately, until all calves are on full feed. After that, they may all be turned together.

FINISHING

THE OBJECT of feeding is to finish the animal. It takes a nine to twelve months feeding period to finish the baby beef steer calf, for he grows as well as fattens. Simply keeping a calf from going "off feed" for this long period calls for close attention to details and the exercise of some ability. The length of the period makes it very likely that any serious mistakes are going to show up before the finish but usually it is too late to recover the time lost by the time the correction is made. So plans should be carefully made and followed closely. Since the calves were started with

oats, the change in the ration may start by using one-third ground corn and cob and two-thirds oats. Feed about one-half pound per day for each 100 pounds weight of calves. For the first several months, grain will probably be fed twice a day so half the daily allowance is fed each time. Increases in corn should be made gradually with the idea in mind that as soon as possible, which is usually about four weeks, the calves should be taking all the feed they will clean up. Before they reach full feed—or all they'll take at a feeding—they should clean up their grain in half an hour, but by the time they are on full feed they should be allowed an hour.

By this time the proportion of oats should be down to 10 per cent. Changes in kind or amount should always be made gradually and the character of the droppings noted. If the calves are "off feed" or refuse to clean the bunk, the reason should be looked for promptly. Omit the next feed and start with the amount reduced by half and return to full feed within the next three or four days if the animals show no ill results. During this period the hay consumed will weigh more than the grain consumed, but this proportion will gradually change until the last months when the amount of hay consumed will be about one-fourth that of the grain. Legume hay, alfalfa or clover, may be started this first month by mixing it in gradually with the grass hay and increasing it until all legume hay is fed, if desired. But alfalfa, particularly, should not be allowed to get wet, for then the danger of bloat is increased. Experience has taught many feeders that it pays to have grass hay in the ration all the time during long feeding periods.

AVAILABLE FEEDSTUFFS

A BALANCED, or complete ration is one day's allowance of all the necessary feed requirements in proportion and amount to meet the feeding goal. Since cattle feeding is a means of marketing farm products, home-raised feeds should make up as large a part of the ration as possible. However, adequate research has proven that some feeds not raised on the farm can be used profitably with home-raised feeds to supplement, or make complete, the desired rations. Rations for cattle, considering the large digestive system of cattle, should have bulk. Variety usually adds palatability; beet pulp, molasses, roots, a little juicy or succulent green feed, or even a slight variation of grains or hay make the ration more attractive. The ration should be digestible and cause no ill effects. Constant observation and practice trains one in the making and use of rations. The recorded experiences of successful feeders and research workers provide the best available guide for the beginner.

Our common feeds are grouped into roughages and concen-

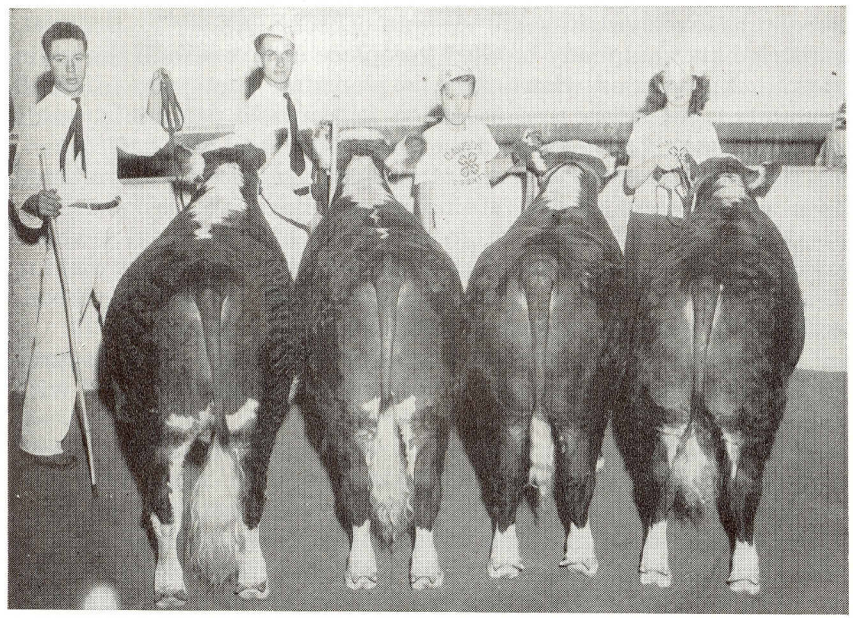
trates. Roughages are high in fiber and low in food value, while concentrates are high in food value and low in fiber. Both include sources of carbohydrates and proteins. Carbohydrates are sources of heat, energy and fat, while proteins supply a large part of the muscles, cartilages, connective tissues, hair, horns and hoofs, as well as some of the internal organs. Grass hays, including corn fodder and corn silage, are roughages that yield carbohydrates, while the grains, dried beet pulp and molasses are concentrates that are classed carbohydrates. Legume hays, of which alfalfa and the clovers are common examples, are roughages that are sources of protein, while protein concentrates include linseed meal, cottonseed meal, soybean oil meal and wheat bran.

Since protein is the feed constituent in which most home-grown feeds are deficient, the term "feed supplement" usually is taken to mean a protein feed when secured from commercial sources. Many feeds which are on the market contain food substances raised at home. They are usually good feeds but they should be considered as added or substitute feeds and not protein supplement unless bought for the known protein they contain. Molasses is wholly carbohydrate, and should, in no sense, be considered a protein supplement.

Corn is the important part of the fattening ration and it is usually home-grown. Corn puts on hard fat rapidly, but when fed alone as the major part of the ration does not provide as smooth a finish as desired in show animals. Fed in ground ear corn at first, the cob content is reduced by adding one part shelled corn to four parts ear corn and gradually increasing the shelled corn percentage. With calves started in the fall, the cob should be entirely removed from the ration by spring, especially if oats or barley are part of the ration. In grinding or cracking shelled corn, every kernel should be cracked into two or three pieces but the forming of meal should be avoided. Calves do not like fine meal, especially when hot weather comes.

In case shelled corn has been fed during the winter it is best to make the switch gradually to cracked corn by hot weather. In hot weather plan to crack corn every 10 days. Cracked corn heats easily and if moisture content is not low some souring may take place. To maintain palatability by avoiding the bitter taste due to the mold in worm-eaten kernels, ear corn may be selected from the crib for soundness and cleanness, and the worm-eaten tips cut off so that in shelling only clean, sound kernels go into the grinder. A good feeder does not hesitate to taste the feeds he knows. He can usually find out in this way the cause for the refusal of feed if smelling has not helped him make the discovery in the first place.

Oats add bulk to the ration and have higher protein content than corn. Oats need not be ground for calves except in hot weather when there may be some advantage in crushing them. Oats make a fine starting ration. They add variety, increase palatability and they may be substituted for barley, or used with barley, in case some carbohydrate in addition to corn is desired. From 10 to 20 per cent of the ration may be oats in hot weather, when barley is not fed, to aid in keeping up the total intake of grain. At this stage of the feeding period, the hay consumption is small and bulk added by oats helps maintain a desired consistency to the droppings.



Purple ribbon 4-H Hereford steers, Nebraska State Fair.

Barley adds less bulk than oats. Barley is considered a good feed to use in the finishing period as it contributes to smoothness of finish. When used to make up over one-third of the ration there appears to be danger of bloat, but 25 per cent of the ration gives good results. Some feeders cook barley slowly for a few hours in preparing for feeding to show stock. Dry barley is too hard to eat unless it is ground coarsely or rolled. It takes about 112 pounds of barley to equal 100 pounds of corn in feed value.

Wheat compares favorably with corn in feed value but, fed alone, it becomes pasty in the mouths of cattle and is difficult to eat. It is lacking in palatability. Coarsely ground or rolled and mixed with a greater amount of bulkier feed, wheat can be used in the ration. Alfalfa should be available with wheat. A better finish can be expected when corn is used with wheat.

Rye should be coarsely ground and is used to advantage when corn is scarce, but corn should be a part of the ration to insure a better finish. Rye should be known to be clean, of good quality and definitely free from the fungus known as ergot.

Grain sorghums make very good feed when fed as "chop," or ground. They replace corn, but are more desirable fed with yellow corn. Green alfalfa should also be fed with sorghums, since sorghums are short in some vitamin content.

Dried beet pulp may be used to replace up to one-half the grain ration. In sections where corn is plentiful, beet pulp in small amounts is fed either dry or soaked. It increases palatability, aids digestion and is thought to reduce the likelihood of bloat.

Protein concentrates most often used are commonly referred to as supplements as they are used to complete the ration which, for the most part, comes from the farm. Linseed meal is made by grinding the cake resulting in pressing of flaxseed in making linseed oil. In addition to being a good source of protein, it contributes to a sleek appearance and is gently laxative.

Cottonseed meal, processed from cottonseed, is a good source of protein. It should be fed with green-colored alfalfa and with a good mineral.

Soybean oil meal is a by-product resulting after pressing the oil from the soybean. It is more palatable than either of the other two.

Any of these three may be secured in forms coarser than meal. Calves prefer coarser forms to meal. Feed processors sell any of these protein feeds in pellet form, including combinations of two or more with the possible addition of minerals or of minerals with feeds. The addition of molasses adds palatability to the pellet or "cube," as large-size pellets are called.

Wheat bran is a by-product in making flour from wheat. It is chiefly the outer coat of the wheat grain. Fitters of show cattle use it consistently. It adds bulk and palatability in addition to its feed value to the ration. It contributes to good digestion.

Prairie hay is considered the best roughage by most experienced herdsmen for fitting cattle. Rarely can any digestive trouble be laid to it and after animals have been "off feed," prairie hay is usually the first item of the ration to which they return. It's the best feed for starting range-raised calves. It should be cut early

enough to get the bright green color and put up promptly to retain it. The earlier prairie hay is cut, the higher the protein content. It should be stored with good ventilation to prevent its becoming musty.

Bromegrass is a source of hay on a steadily increasing number of farms, not only due to its use in rotation as well as permanent pastures but from its use in soil conservation practices on areas not always conveniently located for pasturing. Bromegrass should be cut in the early bloom stage for hay. However, since the leaves do not become dry and lose their green color with ripening of the seed, a useful hay crop of lower quality can be cut after the seed has been harvested with a combine. The combine cuts high, leaving a tall stubble in which the leaves are for the most part untouched. This hay should be fed with alfalfa if alfalfa is not grown with the brome according to the modern approved practice.

All grass hays, including sorghums and the corn plant, make good roughage. Their palatability can be enhanced by careful harvesting and storing. Dirty and moldy feed cannot be fed profitably to fattening cattle. Silage is good roughage, particularly early in the feeding period. It adds to palatability if a small amount is used later. But it is too bulky if fed freely to encourage a full grain ration, and it causes paunchiness. Wasty middles have no place on finished animals.

Alfalfa and the clovers provide protein roughages. Dried beet tops also are classed with the protein roughages. Alfalfa, to the calf feeder, should mean bright green, leafy hay. Green color assures Vitamin A content not provided in the rest of the ration. Alfalfa should be fed where it can be kept dry. While it may be fed in the open during most of the cold weather with not much likelihood of trouble, when the frost comes out in the spring and the calves clean up some of the hay in the bunks which is soaked due to melted snow or rain, bloating is not uncommon. Never feed moldy alfalfa to fattening calves.

Beet tops give best results when fed with alfalfa. They also make a definite contribution to the concentrate part of the ration.

Minerals are found in sufficient amounts in usual rations with the possible exception of calcium and phosphorus, and of course, salt. While the actual body need is only about two-thirds to a pound of salt per month, it is relatively cheap and should be available to the calf at all times. While about one-fourth pound of salt may be added to 100 pounds of mixed feed to make the feed more palatable, addition of larger amounts may reduce palatability to some cattle but be acceptable to others. Likewise, the force feeding of calcium and phosphorus through the mixing of

ground limestone and steamed bone meal in the ration may make the feed unpalatable. Animals will take the necessary minerals if they are available to them. The actual consumption will be small but that small amount is important. When a few handfuls of green alfalfa are fed each day, less added minerals are needed.

Every calf pen should have a mineral box of two compartments. It should be located under cover. One compartment should contain salt. Common barrel salt is preferable to slowly soluble forms. In the other compartment should be a mixture of two parts ground limestone, two parts steamed bone meal and one part salt. The amounts consumed will vary with the ration but calves will adjust the whole ration to their needs when given this opportunity. Do not estimate the importance of this arrangement by the small total consumption. Its need has been proven.

There is much to be learned about vitamins. However, the need for their recognition, and appreciation of their value to the ration is established. Vitamins are substances within foods which play essential roles in the process of normal animal growth and development. Their absence may cause disease. A variety of sound, clean feeds in a ration is the best assurance of getting necessary vitamin content. The green color of alfalfa and yellow color of corn are examples of definite sources of needed vitamins.

MAKING UP RATIONS

IN MAKING UP rations it should be kept in mind that the object is to fatten. The length of the feeding period must be kept in mind and a program followed that fits every stage of it. A careful start is the preparation of an animal for taking all the fattening feed he can during the months when his probable gains are the greatest. Calves started on feed in the fall usually increase daily gains during the winter but in the second hundred days, or during the spring months, daily gains are usually the highest and some slowing down must be expected during warm weather of the third hundred days. Cool weather following summer usually makes possible more rapid gains at the finishing time for calves held for late fall or winter shows and sales.

A calf on full feed will vary in amount of feed consumed daily at stages of the feeding period from 1.5 to 2.5 per cent of his weight with the average daily consumption about 1.7 to 1.8 per cent. Bulkiness and palatability play their part in this variation as well as the age, size and individuality of each calf. The following rations may be used in or adjusted to the stage of the feeding

period they best fit, or according to the availability of home-grown feeds and supplements to be bought. All parts are by weight.

Coarsely ground corn and cob	10 parts	
Oats or bran	1 part	green alfalfa
Cotton seed cake (screening size)	1 part	
Corn, shelled or cracked	7 parts	
Linseed meal (pea size or pellet) or soybean meal (flake)	1 part	prairie or other grass hay
Corn, shelled or cracked	5 parts	
Ground barley	5 parts	green alfalfa
Cotton cake (screening) or mixed pellet	1 part	
Corn or sorghum chop	4 parts	
Ground barley	3 parts	prairie or
Linseed meal (pea size) or mixed meal pellets	1 part	grass hay

An attempt should be made to add a good handful of green alfalfa to the grass hay of each feed. The habit should be cultivated, in mixing feed, of thinking in terms of pounds. If measuring cans or pails are used, make a table showing the weight of each ingredient per measure. In mixing, place light or bulky feeds in the mixing box or barrel first and add others in order with the heaviest last. In turning, this makes the use of the shovel easier as the heavy feeds settle through the lighter feeds in mixing. Whether feeds are transferred from the farm supply or bought elsewhere, put down the necessary information on the feed record card, to be transferred at least once a month to the project record book. Records made on the spot receive the most consideration.

While good beef production can be secured with grain while on pasture, it is poor business to turn a calf on grass after he has been carried all winter as he should. He cannot eat enough grass to fatten ahead of growth and the succulence and palatability of the grass will cause him to refuse full amounts of grain. It is the most common practice to keep beef calves on feed restricted to the dry lot. A few handfuls of tender green grass, or cut up roots, each day are eaten with apparent enjoyment. Silage also may be used. A short grazing period is enjoyed after a full feed but it should not approach the condition of being on pasture. A half pint of molasses mixed with a like amount of water may be mixed with each feed to increase palatability.

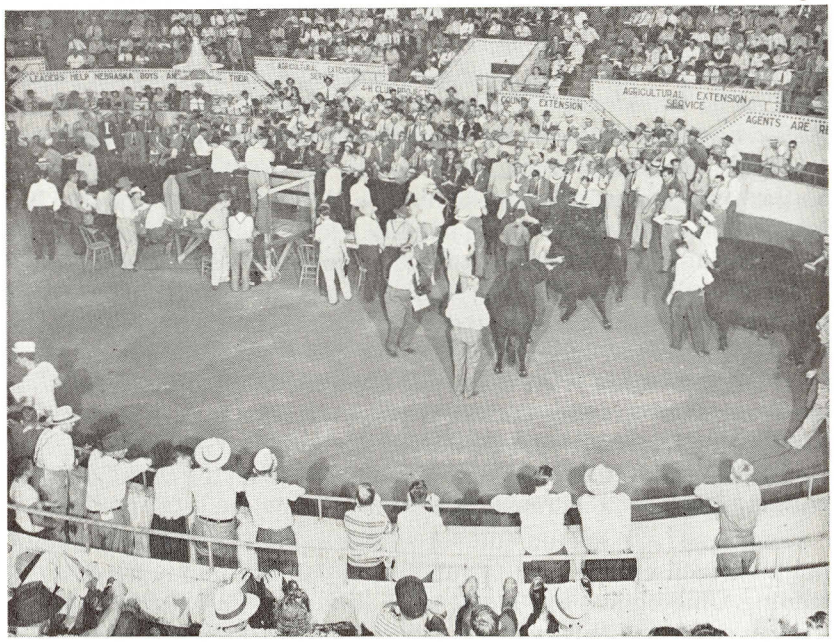
After animals are on full feed, regularity of feeding is important. In fact, calves well toward the finish become restless when feeding time comes and no feed is in sight. The system adjusts to regularity and this is to the advantage of the feeder in uniform daily gains. As the feeding season advances, feeding may be done

three times a day. In this case many feeders omit the noon feed regularly once a week, usually on Sunday. Feed should be cleaned up within an hour. Feed that calves have drooled over may sour before the next feed which, if eaten, may cause scouring. Left-over feed should be cleaned from the bunks, saved and used for other stock.

Changes in the ration should be made gradually. Avoid sudden changes. Plan to have supplies on hand. Calves on feed are sensitive, even to changes of but one ingredient. If the source of corn is changed, secure the new supply before the old supply is gone and start using the new supply by mixing it with the old. Experience in a lack of appreciation of this method usually includes having calves go "off feed" for a few days. A day of loss or of no gain simply means less total gain at the end. After feeding, the calf should have a cool, dry place to lie down with plenty of clean bedding.

DISEASES AND PARASITES

THE SO-CALLED "normal hazards" of feeding include diseases that may not have been apparent when calves were secured or that



Auction of 4-H beef calves, Nebraska State Fair.

were in the incubation period at the time, as well as some diseases that may be contracted later. Likewise, the presence of parasites in some form or other is very probable. Shipping fever is the most dreaded for it is very common and causes more losses of club calves than any other trouble. Usually this loss is sustained within the first month of moving the calf to the home of the feeder. Lice, ringworm, warts, warbles or grubs will, more than likely, call for attention through the appearance of the respective condition indicating one or more of them. Be prepared to meet the situation as it may develop.

Blackleg is an infectious disease of young cattle for which there is no practical cure. Very definitely, all calves should be vaccinated against blackleg.

The disease commonly referred to as **shipping fever** causes large losses, particularly among young cattle. The direct cause is not well understood, but when it develops it is usually following some condition that lowers the vitality of the animal. When securing calves away from home, club members should secure them without frightening them, making them angry, tired, hungry or thirsty, and particularly should not get them too warm. Means of transportation and pens through which diseased animals may have recently moved should be avoided. In case of the appearance of the disease the calf will move very listlessly, his ears may droop somewhat, he will not eat and will be found to have a fever. There may be a soft swelling under the skin of the throat or dewlap, and a swelling of the tongue causes the calf to drool or slobber. Provide a dry, well-bedded place out of drafts and call a veterinarian to treat him.

Lumpy jaw is the common name applied to swelling or enlargement of regions of the head and throat and particularly in the region of the jaws. Two distinct diseases are now recognized, either possibly being the cause of swellings noted on the outside. The veterinarian may provide successful treatment in some cases but more often the market is the best way out.

Pink eye is a contagious disease of the eye of old and young cattle. Pink eye is a general term for an inflamed condition of some of the membranes of the eye lid and eye ball and may arise from more than one cause. Usually a flow of tears can be noted with a tendency to keep the eyes closed. The eye lids may be swollen. It rarely occurs in winter. Diseased cattle should be separated from healthy cattle and put in darkened stalls with fresh water and a rather light, succulent diet. The veterinarian may prescribe treatment. Vaccination has prevented occurrence

of the disease only in part of the cattle treated. White or cloudy spots on the eye ball indicate animals that may have had the disease.

Foot rot is an inflammation of the foot between the toes. Swellings usually are seen above the hoof. These swellings feel hot and usually indicate pus beneath the wall of the hoof at the top. The calf will lie down most of the time and show soreness in the foot in walking. Action should be prompt. Keep the foot soaked in a two per cent solution of coal tar disinfectant. The veterinarian may treat with drugs. Keep the feed lot well drained.

Founder is usually detected in the apparent tenderness of the feet by the calf's unwillingness to walk freely. The forefeet may be placed ahead in an effort to relieve the toes of weight. This indicates infiammation of tissues within the wall of the hoof. When the trouble is noticed after the calf has been started on feed, it has likely been caused by overeating, not particularly in total amount but of some part of the ration. Unless recovery is very prompt the tenderfootedness may continue and by the end of the feeding period the toes will have grown out and the feet appear large. While the calf may finish profitably, its desirability for show is decidedly reduced.

Bloat is the tightly distended middle of an animal due to the formation of excessive amounts of gases in the digestive system. It is indicated when the left side appears much more rounded out than the right side and particularly when the area ahead of the left hip and back of the last rib is distended outward and above from that on the right. The nature of the cause is not definitely known but a number of things are known to contribute to a possible situation from which bloat may result. Succulent feeds of which an animal may get his fill in a short time without proper mixing with saliva appear to promote a situation from which bloat is possible. Gas formation is a part of normal digestion and the escape of gas in reasonable amounts is provided for through belching. If the entrance to the stomach is blocked, belching is stopped. In severe cases, the animal may stand as if bracing himself and the eyes appear glassy. Then it is time to use a trocar and cannula.

The trocar is an instrument about like a nine-inch screwdriver which has a three-cornered sharpened point instead of the bit of the screwdriver. A closely fitting tube with a widened collar at the upper end fits over the trocar. It is called a cannula. With the trocar in the cannula, its point is placed against the outermost and highest part of the bulge between the left hip and left rib. It is directed toward the center of the "middle" of the animal and

driven in so that the collar of the cannula rests against the hair. The trocar is then withdrawn, leaving the cannula through which the gas escapes. If no trocar is handy, use a pocket knife.

Some cattle bloat frequently and regularly. They are called chronic bloaters. If the situation is not corrected by a change in the ration, the animal had better be sold so far as his finishing satisfactorily is concerned. Bloaters mean added risk. When bloaters fill on gas, it gives them the full feeling that feed gives but does not produce weight. They are usually poor doers. Prairie hay used as the principal forage is one of the best feeding practices known to reduce the probability of bloat.

Scours, or diarrhea, is the too rapid discharge of the contents of the bowels. These discharges are usually thin, watery and have a bad odor. Digestive disturbances due to faulty ration, improper handling, internal parasites or bacterial infections may be the cause. The presence of blood in the discharge usually indicates bacterial infection. The cause should be determined. When corrective measures in the ration or handling do not stop it, a veterinarian should be consulted. Exercising prevention is a part of good management.

Ringworm is an affection of the skin caused by a vegetable parasite. Circular grayish patches, one-half to two inches in diameter from which the hair disappears, form on the skin of the head and sometimes about the tail setting. It spreads by contact and is communicable to man. The fingers should be kept away from these patches. It is common in winter and usually disappears shortly with the shedding of the winter coat. In treatment be sure to soak the crusts thoroughly. One good application of tincture of iodine mixed with an equal part of glycerine to make application easier, should cure it. Squeeze the mixture gently from a small cloth or sponge to control its flow in preventing any of it from getting into the eye.

Warts are formed by an overgrowth of skin, usually on the head and neck of young animals, although they may be found almost anywhere on the body. They are usually caused by an infection through some slight injury to the skin. They disappear as the animal gets older. Warts should be treated early to prevent growth. The fingers should be kept away from them. Large warts should be soaked daily with tincture of iodine. A small pump oil can is an easy means of application if used carefully. Small warts will usually disappear in two or three weeks after being soaked daily with sweet oil or castor oil.

Flies. While the injury to cattle from the attacks of flies may be slight, their annoyance is a cause for reduced gains. They suck

the blood from the animal host and cause restlessness. Two distinct insects should be recognized in planning control. The stable fly usually attacks the legs of cattle and does not remain after feeding but rests on the ceiling and walls of sheds and on fences outside. While the chemical known to the trade as DDT has brought about marked changes in insect control, it is prepared for use in different ways. Particularly for putting directly on animals, the proper formula should be used. Do not use DDT solutions or preparations of DDT in oils, for direct contact with animals. For control of the stable fly, a residual spray containing two per cent of wettable DDT is used in spraying walls and ceilings of barns and sheds. One pound of wettable DDT powder in three gallons of water provides a convenient amount and it should be used two or three times during the summer.

The horn fly spends most of the time on animals. The spray is applied directly on the animals, using a water suspension of one-fourth of one per cent wettable DDT. To prepare it, use two ounces of 50 per cent wettable DDT powder in three gallons of water. Spray it directly on the animals, using about one-half gallon per head, mostly on their backs. Apply every two or three weeks.

Some fly sprays will kill flies quickly but most of them are called repellents for they cause flies to stay away as the spray is offensive to them. Some sprays contain kerosene and damage the hair if used regularly on show stock. Their use is justified at summer fairs to prevent flies from causing the animals to become restless in the show ring. A repellent for use on the legs only, and consequently used mostly against the stable fly, is a mixture of two quarts of fish oil, one quart oil of tar, and four teaspoonfuls (two-thirds ounce) of crude carbolic acid. It may be painted on lightly with a brush, or sprayed on. Apply smoothly to avoid any gummy appearance to the hair when showing. This should give results for about two days.

In fly time most herdsmen have stalls kept clean of manure so that flies will not be attracted to possible breeding places. Stalls should be darkened. Some large pieces of burlap hanging from above, low enough to enable calves to brush flies off as they move against and under them, allow the calves to get relief. The hanging burlap should be sprayed with DDT. When flies do get into screened and darkened stalls, they may make at least one attack before DDT has a chance to kill them. Caretakers should be careful not to come in frequent contact themselves with surfaces treated with DDT.

Lice. There are three species of lice that infest cattle and all of them spend their entire period of life on the animals. All may be present on one animal at the same time. A suspension containing one-fourth of one per cent DDT is used as a dip or spray in lice control. As a dip, use four pounds of 50 per cent wettable DDT powder to each 100 gallons of water. As a spray, mix two ounces of wettable DDT powder with three gallons of water. The animals should be wet thoroughly.

Rotenone (one per cent), as commonly prepared and sold for grub control, is one of the best preparations to use for lice control. Being a powder, it is easily applied in cold weather to any part of the animal's body where lice may gather. Treatment should be repeated in 16 to 20 days with either DDT or rotenone dust to kill lice hatched following treatment. DDT probably kills more lice hatching after treatment than rotenone, due to its residual effect.

Two kinds of cattle lice are blood suckers. They are the ones commonly called "blue lice." The third is a smaller reddish or yellowish biting louse. Lice increase in numbers with the growth of the winter coat of hair. When this hair is shed most of the lice disappear, except that lice continue to develop on calves kept in sheds. The biting louse is of particular interest to the club member. Biting lice may gather in large numbers at some points and set up some irritation with the result that the skin thickens with a roughened surface. This may be noted at the top of the shoulders and about the tail attachment, but particularly it should be watched for at the end of the tail. As spring comes, the end of the tail, where it is covered by the switch, should be felt every two or three weeks. If it shows any signs of thickening or roughness, it's time to get busy. Neglect may result in loss of the switch, not gradually, but all at once for it may be found in the lot some time, intact. There may not be enough time left to grow a new switch before show day. The best assurance against loss of the switch is two or three dippings two weeks apart in the late spring and early summer. It should be made certain that the infested parts are well soaked. DDT as a dip, and rotenone, are satisfactory preparations to use. A gallon can over half full of the desired preparation makes treatment easy. Put the end of the tail into the solution and soak it well.

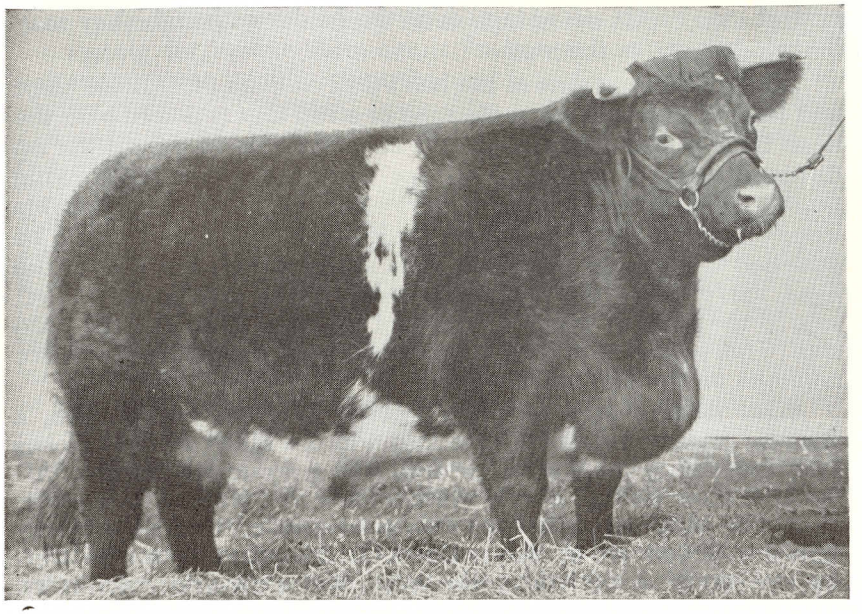
Cattle grubs or **ox warbles** are larvae, or maggots, representing one of the forms in the life cycle of certain flies, one commonly known as the heel fly. The best known means of control is to destroy the grub. The fly deposits eggs on the hair of the lower parts of the legs. Body warmth of the animal hatches the egg in a few

days and the grub burrows through the skin. It migrates through the body and finally comes to rest in the back of the animal where it makes a hole in the skin through which it breathes as it completes its development as a parasite. Each grub causes a swelling finally becoming over an inch in diameter before the grub leaves. These holes heal but leave scar tissue which limits the use of the hide, and that means serious loss. Sometimes more than a hundred grubs may be counted in the back of a single animal at one time. Their presence in large numbers appears to cause reduced appetite in the animal. While grubs may be squeezed out in the case of a few club calves, it is best to treat whole herds in winter or spring as soon as grubs have made holes in the skin of the back or loin. In squeezing grubs out, stand on the opposite side of the calf from the grub. Locate the opening first. Press firmly but slowly toward the opening. Calves appear to like this operation but if a calf does kick it will be with the foot on the side being squeezed. Avoid any sudden pinching. The grub may be ruptured and cause a slowly healing abscess.

Rotenone, a substance proven in insect control, is found in the roots of derris and cubé plants. The roots are imported. They are ground into a fine powder and contain about five per cent rotenone. A so-called rotenone dust can be prepared by mixing one part of derris or cubé powder with two parts of some proven mixing agent. Prepared dust can be purchased. The dust is sifted on to the back of the calf rather generously and rubbed into the openings in the skin made by the grubs through circular movements of the hand and rubbing well against the way the hair lies. A tall, narrow glass jar makes a good sifter. Punch a hole about one-fourth inch in diameter with a spike from the under side of the lid near the edge. Use two to three ounces per calf or treat five to eight calves per pound. Repeat every 30 days until the grubs are gone. Liquid powder sprays capable of delivering 400 pounds pressure at the nozzle are used in applying rotenone content mixtures to large herds.

TRAINING TO LEAD

ONCE THE CALF has become accustomed to his home, and if he shows no signs of having contracted any illness since removal from the pasture of his dam, it is time to step up his training which, in fact, has already begun. His feeder must have some things well in mind. Recalling that the calf must be neither frightened nor angered, it is well to assume that the process should be referred to as "training the calf," rather than "breaking the calf." The latter implies overcoming by force and is certainly not



Royal Jupiter, 1946 International Grand Champion steer, bred and shown by Oklahoma A. & M. College.

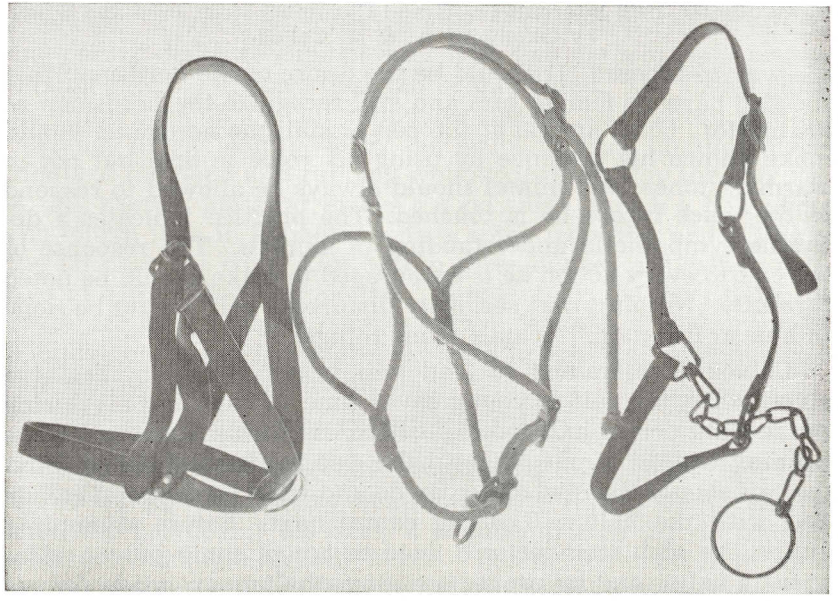
the way to proceed. It should be the desire of the herdsman that the calf have no fear of him and still recognize the herdsman as his master. Upon arrival at the pen or stall the herdsman should make known his presence by using his voice in firm but not in alarming tones. An animal should always be allowed to respond to the voice before he is touched. The practice indicates a desirable sympathetic understanding of animals. The response of the calf to every action he is encouraged to make should be noted carefully. Nothing that seriously disturbs a calf should be done to him in his stall. His stall is his refuge.

Calves once trained to lead will never forget it. Training given when the calf is young saves time in handling all during the feeding period and forestalls needless shrink sustained when training to lead is put off until the calf is nearly finished. First the calf should learn what he can do and what he cannot do when tied with the halter. Leading comes next. Before attempting either, the club member will need to accept some proven ideas about a halter and its proper use. Some halters are made for use principally for tying animals and not for leading them. They are of the kinds that do not tighten up on the jaw when the lead strap or rope is tightened. When used they permit an unruly animal

entirely too much advantage over the leader although they may be satisfactory in the stall.

A calf halter consists of the head stall or head piece, nose piece and lead. The head stall is the rope or strap that is placed over the head back of the ears and should be adjustable to permit use on different sizes of calves or on one calf throughout its growing period. Buckles make strap halters easily adjustable. Adjustable loops on rope halters should be made secure. The lead should be attached to the nose piece and head stall on the right side of the head, carry under the jaw and through a ring or loop on the left side of the head to which is attached the nose piece and the head stall. This permits the lead to be drawn tight under the jaw when response of the animal is wanted.

With halters used only for leading and not for tying-in, a smooth, passing link chain (one that will not kink), 16 to 18 inches long may be on the end of the lead that goes under the jaw. Attractive show halters nearly always have this feature. The halter should be adjusted so that the nose piece crosses the nose half way between the corner of the eye and the nostril of each side. This assures its being over the nasal bone. When the nose piece is too



The halter at the left and the one in the middle are good for tying-in, but are not good for leading. No part tightens under the jaw. The halter at the right is an easily made, inexpensive, training halter.

near the muzzle, the calf may be choked in case the lead is drawn too tightly for even a short time. Frequently, calves improperly haltered appear unruly when the real trouble is that they are resisting choking. The nasal bone does not extend to the muzzle and consequently does not protect the air passages low down on the nose.

In putting a halter on an untrained calf it is best to corner the calf behind a panel where he can be reached without having first caused needless running. Get him where he has no chance of getting away. It is better to crowd two or more calves together, for then each one becomes less excited than when caught up alone. Fit the halter comfortably. Tie each calf securely, preferably with a knot that can be untied readily if necessary. Allow about 18 inches of lead and tie about 24 inches above the floor or ground so that the calves may lie down but with small chance of becoming entangled. The first time or so, it is best to tie them but a few hours, preferably when one can be around occasionally to note how they get along. After that they should be kept tied for about two days. By this time they should yield to the rope. When tied they should have nothing done to them that will excite them. If they do become excited, they usually calm down if brushed gently but firmly, especially around the rump where it is difficult for them to scratch themselves. Stay away from the head until the calves become quiet. A calf should never be tied or led without permitting him some freedom of his head. After being tied two days, calves should be turned loose again. In the training process it is well for them to find out that freedom follows each time they are haltered.

The next step is training the calf to lead. Response comes readily after the calf finds out what is expected of him. Patience in the trainer brings best results. A long rope should be attached to the lead to insure preventing the calf from getting loose. Once a calf gets loose he is likely for sometime to try to make his getaway whenever he senses an opportunity. The long rope should not be anchored or snubbed to anything secure for he may break his neck if brought to a too sudden stop. Have plenty of help to hold him in case help is needed. Put on the halter and drive, rather than try to lead him, to some nearby lot, preferably one that is enclosed. If a trained calf or cow can be led ahead of him it helps. Drive him toward the lead animal. He will probably try to make a break. Stop him carefully but let him play around with the long lead. Use it only to restrain him and not to lead for awhile. When he quiets, drive him toward some chosen destination, possibly his water tank or feed bunk. Then turn him loose. Do this regularly for a few days, always to the same des-

tination. In this way he finds out what is expected of him and he'll usually begin to lead. The next step is to lead him on new paths. If he lags, pull firmly, then relax the lead alternately. Do not jerk. It may help to pull him to one side and then to the other. This procedure holds good in all future lagging. Lead the calf out in the presence of strangers at every opportunity.

CASTRATE EARLY

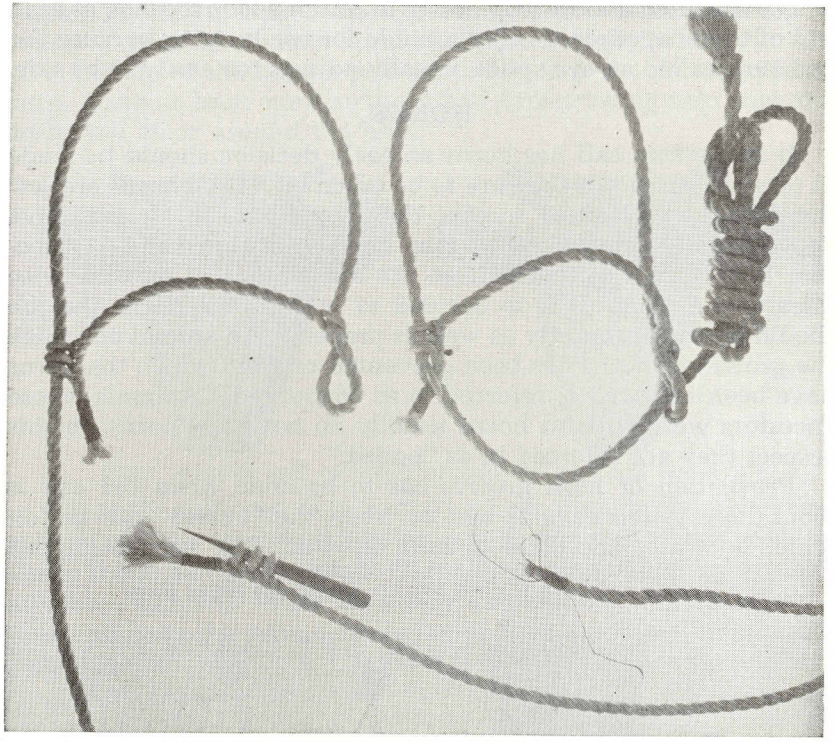
WHILE MOST 4-H feeder calves will have been castrated long before weaning, this job is not always done on time. It should be done before much coarseness has developed along with and as part of masculine character. In the show steer a smooth, well-balanced cod (scrotum with fat therein) is desired. Scar tissue sometimes causes a noticeable puckering of the skin on the side or back of the scrotum, which becomes more apparent as it fills with fat. To avoid this the incision should be made on the front side of the scrotum but extending well down to insure good drainage.

HALTERS

ROPE HALTERS are commonly used in tying cattle. Since cattle grow rapidly, the halters are made readily adjustable. Manila rope is preferred as manila hemp is stronger, softer and more pliable than sisal hemp. Rope of various diameters may be used for cattle of different ages, but a halter made of 12 feet of five-eighths inch rope is most common with club calves. While end splices may be used to finish the rope ends, whipping is usually done for it leaves the end of the lead small enough to be passed easily through tie rings.

Whipping. Take a piece of strong cord about 30 inches long in the right hand. Make a loop with the cord six or eight inches from the short end. (That part of the rope between the point of work and the nearer end is called the "short end," the other the "long end.") Grasp the rope in the left hand, leaving about two inches extending to the right from under the first finger. Place the loop at the end of the rope with the ends caught under the first finger of the left hand. Take the long end of the cord and wrap it tightly and smoothly around the rope end, wrapping with the twist of the strands, until within one-half inch of the rope end. To draw the first one or two wrappings tight, pull on that part of the loop formed by the long end. Then tuck the unused cord through the exposed loop. Pull on the short end of the cord until the loop draws the long end tight and well under the whipping. Cut off the loose ends of cord. Soaking the whipping in water-proof cement makes the job more secure.

The loop. A marlinspike is used to make separation of strands easier. A marlinspike is a round piece of iron or wood pointed at one end, the other end serving as a handle. The pointed end may be flattened somewhat. After pushing it between two strands of rope, the strands are easily spread by a one-fourth roll of the marlinspike. Take the rope in the left hand. Allow 22 or 23 inches to extend to the right, between the hand and the whipping, for the short end. Grasp the rope between the thumb and fore-finger at this point and, with the marlinspike, open the rope by lifting two strands. Bring the short end around, clockwise (to the right) and put it through the opening in the rope. This forms a loop. Close this loop until the inside diameter is about twice the thickness of the rope. A loop that is too small closes too tightly when the halter shrinks upon getting wet. Next, grasp the loop with the right hand. With the marlinspike, open the short end of the rope outside but next to the loop, lifting one strand. Then take the long end of the rope, bring it from the left and push it



Completed rope halter is at upper right. It has the desirable features of a halter.

through the opening made in the short end. This completes the loop with an equal number of strands on each side of the splice. This procedure leaves the inside of the splice very smooth where it bears against the jaw of the calf.

The nose piece. The short end of the rope becomes the nose piece of the halter. Measure off 11 inches of it from the loop. With the hands two or three inches apart, one at each side of this point, grasp the rope firmly with one hand and untwist it with the other. Then close the distance between the hands slightly, keeping the rope untwisted. This allows each strand to form a separate loop. These loops may be opened further and brought into line by working the marlinspike through all three at once. Take the long end of the rope and tuck it through all three loops starting with the inside loop. Draw it through until the loop formed becomes the right size for the head stall or head piece of the halter. By putting the long end through the loop at the other end of the nose piece, the halter is completed. This halter is readily but safely adjustable.

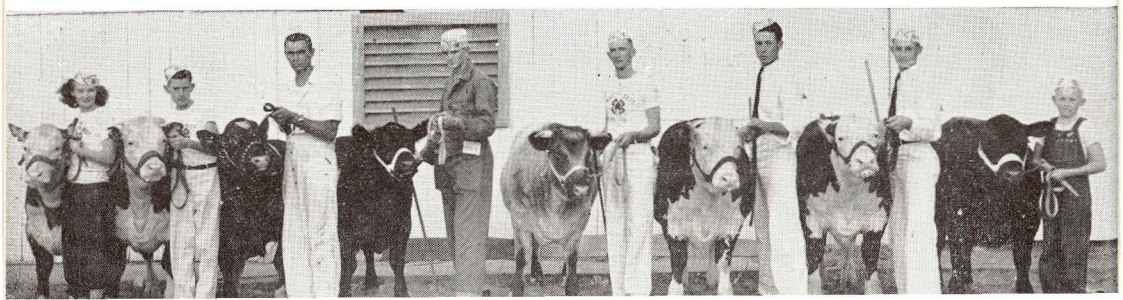
The so-called double loop halter in which a loop is made at each end of the nose piece is objectionable for use in tying because the end loop, called an eye splice, usually adjusts too easily to be safe.

HORNS

IF THE FEEDER calf has horns an early decision should be made as to whether or not they are to be taken off. If the horns are left they should be trained so that they contribute to an attractive appearance. Neglected horns may develop in shape and in direction that detract seriously from the appearance of an otherwise attractive animal. If it is decided to remove the horns the job should be done promptly as well as properly. An animal on which the growth of horns has been prevented or from which the horns have been removed is referred to as "dehorned." Animals whose ancestors were without horns usually do not grow horns. In this respect they are referred to as "polled."

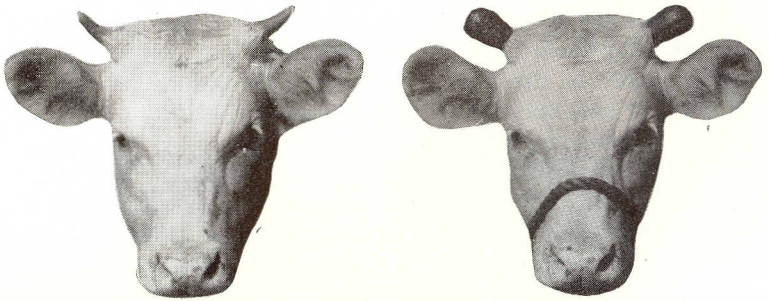
Prevention of horn growth has to be done when the calf is from three to ten days of age, or when the "button" can be felt which indicates the start of horn growth. The hair is clipped

Purple ribbon 4-H club beeves, Nebraska State Fair.



about and over the button. A stick of caustic is wrapped with paper to protect the fingers but with one end of the caustic exposed. The clipper area is rubbed with the moistened end of the caustic until it becomes inflamed. Calves should not be turned back with cows for a few hours, or left in rain, until the caustic has been neutralized by its action on the button area. In case of necessity, the action of the caustic may be stopped promptly by putting vinegar on the spot.

The percentage of hornless baby beeves is now much higher than in the early years of 4-H club work. Shipper-buyers prefer them, as they cause fewer bruised carcasses. When one or more horned calves are fed with hornless calves, the former usually keep the latter on the move needlessly. In dehorning a calf it is well to consider doing the job right. First, a job that may result in stubs or irregular growth should be avoided. Next, the top of the head, or poll, should be given a neat shape resembling that of a polled animal. A fine toothed, clean, sharp saw is very satisfactory to use. The calf should be restrained securely. The hair should be cut away from around the horns. Hold the saw so that the cut will give the top of the head a pointed rather than a squared appearance. Take at least one-fourth inch of hair-growing skin with the horn, and clear around the horn.



Horn weights put on early should be watched closely.

When the cut is too close to the horn on one side an ugly curled growth of horn results. When no skin is taken, the horn growing tissue is left and stubs result. This shows up as a glaring mistake at show time. When the horn is removed close up, taking some hide and hair, the wound heals faster than when a stump is left, even though it may look bad for a few days. In case there is any danger of flies, paint generously around the wound with oil of tar. Keep the calf in a warm, dry, well-bedded place. It is well to apply a good dehorning powder promptly to prevent needless bleeding. Sometimes a hot iron is used to cauterize the wound.

Weights are put on horns to train them in growth. While some weights are attached by tightening the weight on the horn with set screws, there is less danger of injury or damage to the horn if the weight on one horn is fastened by wire or strap to the other, loosely. Lost weights are usually recovered when calves are kept in small lots. Weights should not be put on until the horn feels rigid, or firmly attached to the head. Horn tissue next to the head is soft, very similar to the base of one's finger nail. Weights that are too heavy and left on too long cause the horn to break rapidly, once it starts, causing an angular kink in the horn for which the remedy is not simple. Prevention rests in watchfulness. Weights commonly used run from three-fourths to one and one-half pounds, the latter for yearlings. The neatest jobs come from putting weights on for a week or 10 days, then taking them off for a few days. Horns vary, but it may take several weeks. Once horns start down, they come rapidly however and may "break" in a few days. When the underside of the horn is level or parallel with the ground, take the weights off. Future growth will produce a very pleasing downward, and usually slightly forward, curve.

EAR TAGGING

ALL CALVES being fed for beef production in Nebraska 4-H projects are identified by the official ear tag.

These tags are serially numbered and show the year they are used in making records at shows and sales, but the tag is placed in the ear early in the project. The tag should be placed in the top of the left ear, about half way between the base and tip. The face of the tag bearing the number should be up, on the outside or back of the ear to make reading easy. The proper record should be made promptly.

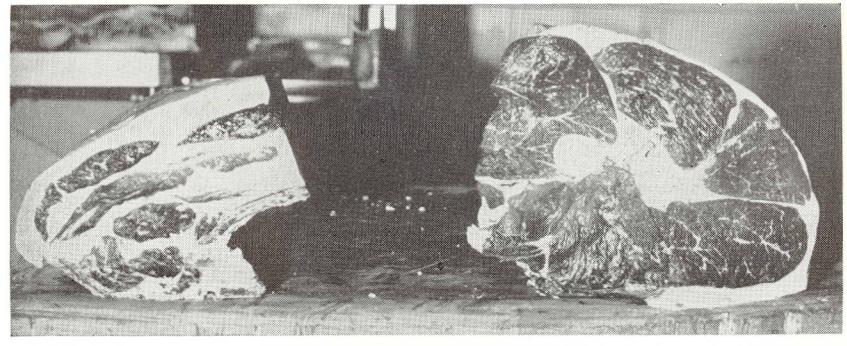
In tagging, calves may be handled in small groups or singly. A calf should never be snubbed up close in doing this job. Three or four calves may be crowded closely, but securely, behind a gate or panel. Use a halter or throw rope to hold up the calf's head. It is better to have one calf between the person doing the tagging and the calf worked on. Examine the ear by holding it toward the sun or against a flashlight to locate the larger blood vessels. Avoid cutting them and prevent needless bleeding. The pliers, or tagging tool, should have a thong (a long leather boot lace is good) fastened in the end of the handle of that jaw having the shorter bit. This will enable the pliers to be withdrawn from the ear with little or no chance of tearing the ear.

Check the number on the tag. See that the number is on top. Locate the spot in the ear free from large blood vessels. Put the

upper jaw of the pliers on the chosen spot, allowing one-half inch of the tag outside the ear. If the tag is placed over the ear as far as it will go, it will curl the ear in closing and be too tight. Close the tag quickly and completely with one firm grip on the pliers—and then, just as quickly, drop the pliers and at the same time give the calf his freedom at the halter. Usually the calf struggles, the pliers follow him until he shakes them off, and then he becomes quiet. The job usually may be checked without any apparent resentment and pliers retrieved if it has been necessary to release the end of the thong. Do not try to hold to the pliers. That may mean a torn ear and less ease in handling the calf in the future. After all, the convenience or whims of the person doing the tagging is of least importance in this job.

Calves handled singly should be haltered and led outside so that an unpleasant experience is not associated with strangers handling them in the stall. Make the lead rope longer. The holder grasps the lead near the calf's head with the left hand and the end of the lead with his right, keeping his feet free from the slack rope. When the tag is placed, the left hand promptly releases the lead while the end of the lead is pulled up gently. After the calf shakes off the pliers—he seemingly blames the pliers and not his holders —the job should be checked.

For information on preparation for show and showing, see Extension Circular 0-23-2.



Blade end of the rib and the round. These cuts are from the carcass of a 4-H champion beef calf. Note intermingling of fat with lean.